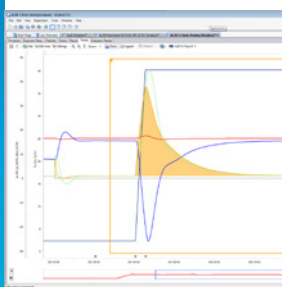


Increase Safety Knowledge Calorimetry from Screening to Production



Understand Process Parameters

EasyMax and OptiMax HFCal combine the benefits of a synthesis workstation and a reaction calorimeter. Thermodynamic information, such as heat transfer, specific heat, heat flow or enthalpy are collected under both isothermal and non-isothermal conditions ensuring process parameters are understood.



Uncover Potential Safety Issues

Critical information, like induction time, start and end of reaction and maximum heat release, combined with more detailed information, such as reaction enthalpy, accumulated energy and adiabatic temperature rise on cooling failure, ensures potential safety issues are quickly identified.



Faster Process Development

Characterize and optimize process parameters in a controlled, accurate and reproducible environment. Collecting safety relevant heat information simultaneously reduces the number of trials – saving time and resources.



Data Analysis

During an experiment EasyMax and OptiMax HFCal collect and store a wealth of information. iControl software automatically calculates and reports heat transfer data, specific heat of the reaction mass, heat flow and reaction enthalpies.



EasyMax® and OptiMax™ HFCal

Uncovering potential safety issues or non-scalable conditions are essential to develop and scale a process safely. However, this information is not typically generated until late in the scale-up phase.

The smaller EasyMax HFCal provides reaction safety information early in development, while the larger OptiMax HFCal determines heat and scalability details to safely scale processes. Both calorimetry workstations provide heat release data, reaction enthalpy and heat transfer as well as specific heat data enabling chemistry and process decisions to be made earlier – resulting in faster process development and safer scale-up.

Increase Safety Knowledge

Calorimetry from Screening to Production

Product Configurations

30090574

EasyMax Calorimetry Starter Kit

The Starter Kit is a heat flow based process safety screening system that quickly provides heat information with minimum starting material on a 100 mL scale. It includes all parts required (except the reactor and stirrer) plus iControl software and HFCal license.

30090576

EasyMax HFCal Upgrade Kit

A calorimetry Upgrade Kit for EasyMax. It is Plug&Play and contains all necessary parts to convert the workstation into a fully functional calorimeter. iControl software is not included. No service call is required for installation.

30064130

OptiMax Calorimetry Starter Kit

The Starter Kit is a heat flow based, ready-to-use system to quickly obtain heat data of any chemical or physical reaction in a 1000 mL reactor. This includes all parts required plus iControl software and HFCal license.

30050150

OptiMax HFCal Upgrade Kit

A calorimetry Upgrade Kit for OptiMax. It is Plug&Play and contains all necessary parts to convert the workstation into a fully functional calorimeter. iControl software is not included. No service call is required for installation.

Technical Specifications

	EasyMax HFCal	OptiMax HFCal
Thermostat		
Heating/Cooling	Electrical/Peltier	
Temperature Range	-40 °C to 180 °C (jacket temperature)	
Control Modes	Isothermal and isoperibolic, constant or ramp, reflux, distillation and crystallization	
Stirring	50 rpm to 1200 rpm	30 rpm to 1200 rpm
Dimensions (Thermostat)	380 mm x 410 mm x 280 mm	388 mm x 414 mm x 539 mm
Power Supply	100 V to 240 V AC, 50 Hz to 60 Hz, 1000 VA	100 V to 240 V AC, 50 Hz to 60 Hz, 1300 VA
Operation	Graphical touchscreen and iControl software for calorimetric applications	

Reactors

Type/Material	Single piece or two piece (Duran® glass)	
Working Volume	30 mL to 100 mL	200 mL to 1000 mL
Pressure	50 mbar to 1 bar	
Stirrer	Pitch-blade (Alloy C-22), Anchor (Alloy C-22), Half-moon (PTFE for single piece reactor)	Pitch-blade (glass, Alloy C-22), Anchor (glass, Alloy C-22), Half-moon (PTFE for single piece reactor)

Calorimetry: Heat Flow

Precision Heat Transfer*	Typically ± 4 %	Typically ± 3 %
Accuracy and Precision Specific Heat*	Typically ± 12 %	Typically ± 10 %
Accuracy Heat Flow*	Isothermal conditions: ± 3 % to 5 % Non-isothermal conditions: ± 5 % to 10 % Based on comparison of q_{r_hf} with q_c resp. f_{qr_hf} with f_{qc} .	Isothermal conditions: ± 3 % to 5 % Non-isothermal conditions: ± 5 % to 10 % Based on comparison of q_{r_hf} with q_c resp. f_{qr_hf} with f_{qc} .
Sensitivity qr Noise*	≤ 0.2 W equivalent to 2 W/L	≤ 0.4 W equivalent to 0.4 W/L

HFCal Module

Power and Data Interface	Direct connection to CAN interface of standard EasyMax/OptiMax, no additional power supply or PC connection required
Data Logging	Via iControl software
Dimensions	120 mm x 40 mm x 170 mm

Software

iControl	iControl 5.2 or higher, HFCal license required
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Calibration Heater

Power	Max. 10 W	Max. 20 W
Material	Alloy C-22	Alloy C-22
Size	260 mm length, 6 mm diameter	300 mm length, 8 mm diameter

*Data determined with silicon oil 47V20 between -25 °C and 160 °C, water between 5 °C and 40 °C, toluene between -35 °C and 75 °C.

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Subject to technical changes.
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Printed in Switzerland, 30101584

www.mt.com/HFCal

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